IN THE CLAIMS

Please amend claims 1, 6, 12, 21, and 30 as follows.

1. (Currently Amended) In an optical fiber communications system, a method for maintaining jitter tolerance of data transmitted across the communications system, the method comprising:

receiving a tributary complying with a jitter tolerance;

recovering data from the tributary;

receiving a reference clock;

converting the recovered data into ~~generating~~ at least two low-speed data channels, wherein the low-speed data channels in aggregate contain the recovered data and each low-speed data channel is timed by a clock based on the reference clock;

modulating each low-speed data channel to generate a corresponding low-speed symbol channel~~, wherein the step of modulating comprises encoding a low-speed channel according to a Reed-Solomon code and interleaving the encoded low-speed channel~~; and

frequency division multiplexing the low-speed symbol channels to produce an electrical high-speed channel for transmission in optical form across the communications system.

2. (Original): The method of claim 1 wherein the tributary and the jitter tolerance conform to a SONET protocol.

3. (Original) The method of claim 2 wherein each low-speed data channel includes:

a framing header and a data rate which conforms to the SONET protocol; and

a payload which does not conform to the SONET protocol.

4. (Original) The method of claim 3 wherein each low-speed data channel includes:

a framing header and a data rate which conforms to the STS-3 protocol; and
a payload which does not conform to the STS-3 protocol.

5. (Original) The method of claim 3 wherein each low-speed data channel includes:
a framing header and a data rate which conforms to the STS-48 protocol; and
a payload which does not conform to the STS-48 protocol.

6. (Currently Amended) The method of claim 1 wherein the step of converting the recovered data into ~~generating~~ the low-speed data channels comprises:
recovering a clock from the tributary;
phase aligning the reference clock to the recovered clock;
retiming the recovered data using the phase-aligned reference clock; and
time division demultiplexing the retimed, recovered data into the low-speed data channels.

7. (Original) The method of claim 6 wherein the step of time division demultiplexing the recovered data into the low-speed data channels occurs in at least two stages.

8. (Original) The method of claim 1 further comprising:
converting the electrical high-speed channel to an optical high-speed channel;
transmitting the optical high-speed channel across a fiber;
receiving the optical high-speed channel;
converting the received optical high-speed channel to a receive-side electrical high-speed channel;
frequency division demultiplexing the receive-side electrical high-speed channel into at least two receive-side low-speed symbol channels;
demodulating each receive-side low-speed symbol channel to generate a corresponding receive-side low-speed data channel;
recovering a clock and data from each receive-side low-speed data channel;
generating a receive-side reference clock synchronized to the receive-side recovered data; and

generating a receive-side tributary, wherein the receive-side tributary contains all of the receive-side recovered data, and the receive-side tributary is timed by a clock based on the receive-side reference clock and complies with the jitter tolerance.

9. (Original) The method of claim 8 wherein the tributary, the receive-side tributary and the jitter tolerance conform to a SONET protocol.

10. (Original) The method of claim 8 wherein the step of generating the receive-side tributary comprises:

time division multiplexing the receive-side recovered data into the tributary.

11. (Original) The method of claim 10 wherein the step of time division multiplexing the receive-side recovered data into the tributary comprises:

storing the recovered data from each receive-side low-speed data channel;

aligning a timing for the receive-side low-speed data channels; and

time division multiplexing the stored recovered data according to the aligned timing.

12. (Currently Amended) In an optical fiber communications system, a method for maintaining jitter tolerance of data transmitted across the communications system, the method comprising:

receiving an optical high-speed channel containing data transmitted across the communications system, the data from a tributary complying with a jitter tolerance before said transmission;

frequency division demultiplexing an electrical high-speed channel into at least two low-speed symbol channels, wherein the electrical high-speed channel is derived from the optical high-speed channel;

demodulating each low-speed symbol channel to generate a corresponding low-speed data channel~~, wherein the step of demodulating comprises reversing~~

~~a Reed-Solomon encoding on a low-speed channel and de-interleaving the low-speed channel~~;

recovering data from each low-speed data channel;

generating a reference clock synchronized to the recovered data; and

generating a tributary, wherein the tributary contains all of the recovered data, and the tributary is timed by a clock based on the reference clock and complies with the jitter tolerance.

13. (Original) The method of claim 12 wherein the tributary and the jitter tolerance conform to a SONET protocol.

14. (Original) The method of claim 13 wherein each low-speed data channel includes:

a framing header and a data rate which conforms to the SONET protocol; and

a payload which does not conform to the SONET protocol.

15. (Original) The method of claim 14 wherein each low-speed data channel includes:

a framing header and a data rate which conforms to the STS-3 protocol; and

a payload which does not conform to the STS-3 protocol.

16. (Original) The method of claim 14 wherein each low-speed data channel includes:

a framing header and a data rate which conforms to the STS-48 protocol; and

a payload which does not conform to the STS-48 protocol.

17. (Original) The method of claim 12 wherein the step of generating the tributary comprises:

time division multiplexing the recovered data into the tributary.

18. (Original) The method of claim 17 wherein the step of time division multiplexing the recovered data into the tributary occurs in at least two stages.

19. (Original) The method of claim 17 wherein the step of time division multiplexing the recovered data into the tributary comprises:

storing the recovered data from each low-speed data channel;

aligning a timing for the low-speed data channels; and

time division multiplexing the stored recovered data according to the aligned timing.

20. (Original) The method of claim 19 wherein the step of aligning a timing for the low-speed data channels comprises:

generating a framing pulse for each low-speed data channel; and

aligning the framing pulses.

21. (Currently Amended) An optical fiber communications system for maintaining jitter tolerance of data transmitted across the communications system, the communications system comprising:

a local oscillator for generating a reference clock conforming to a jitter tolerance;

a clock and data recovery circuitry coupled to the local oscillator for recovering data from a received tributary and for retiming the recovered data according to the reference clock;

a time division demultiplexer coupled to the clock and data recovery circuitry for time division demultiplexing the recovered data into at least two low-speed data channels, wherein each low-speed data channel is timed by a clock based on the reference clock;

a modulator coupled to the time division demultiplexer for modulating each low-speed data channel to generate a corresponding low-speed symbol channel ~~wherein the modulator comprises a Reed-Solomon encoder for encoding a low-speed data channel according to a Reed-Solomon code and an interleaver for interleaving a digital string output by the Reed-Solomon encoder~~; and

a frequency division multiplexer coupled to the modulator for frequency division multiplexing the low-speed symbol channels to produce an electrical high-

speed channel for transmission in optical form across the communications system.

22. (Original) The communications system of claim 21 wherein the tributary and the jitter tolerance conform to a SONET protocol.

23. (Original) The communications system of claim 22 wherein each low-speed data channel includes:

a framing header and a data rate which conforms to the SONET protocol; and
a payload which does not conform to the SONET protocol.

24. (Original) The communications system of claim 23 wherein each low-speed data channel includes:

a framing header and a data rate which conforms to the STS-3 protocol; and
a payload which does not conform to the STS-3 protocol.

25. (Original) The communications system of claim 23 wherein each low-speed data channel includes:

a framing header and a data rate which conforms to the STS-48 protocol; and
a payload which does not conform to the STS-48 protocol.

26. (Original) The communications system of claim 21 wherein the time division demultiplexer includes a multi-stage time division demultiplexer.

27. (Original) The communications system of claim 21 further comprising:

an E/O converter coupled to the frequency division multiplexer for converting the electrical high-speed channel to an optical high-speed channel and for transmitting the optical high-speed channel across a fiber;

an O/E converter for receiving the optical high-speed channel and for converting the received optical high-speed channel to a receive-side electrical high-speed channel;

a frequency division demultiplexer coupled to the O/E converter for frequency division demultiplexing the receive-side electrical high-speed channel into at least two receive-side low-speed symbol channels;

a demodulator coupled to the frequency division demultiplexer for demodulating each receive-side low-speed symbol channel to generate a corresponding receive-side low-speed data channel;

a receive-side data recovery circuitry coupled to the demodulator for recovering data from each receive-side low-speed data channel;

a phase-locked loop coupled to the receive-side data recovery circuitry for generating a receive-side reference clock synchronized to the receive-side recovered data; and

a time division multiplexer coupled to the receive-side data recovery circuitry and the phase-locked loop for generating a receive-side tributary, wherein the receive-side tributary contains all of the receive-side recovered data, and the receive-side tributary is timed by a clock based on the receive-side reference clock and complies with the fitter tolerance.

28. (Original) The communications system of claim 27 wherein the tributary, the receive-side tributary and the jitter tolerance conform to a SONET protocol.

29. (Original) The communications system of claim 27 wherein the time-division multiplexer comprises:

a state machine for aligning a timing for the receive-side low-speed data channels;

buffers for storing the recovered data from each receive-side low-speed data channel and releasing the stored recovered data according to the aligned timing; and

multiplexers for combining the released data.

30. (Currently Amended) An optical fiber communications system for maintaining jitter tolerance of data transmitted across the communications system, the communications system comprising:

a receiver for receiving an optical high-speed channel containing data transmitted across the communications system, the data from a tributary complying with a jitter tolerance before said transmission;

a frequency division demultiplexer coupled to the receiver for frequency division demultiplexing an electrical high-speed channel into at least two low-speed symbol channels, wherein the electrical high-speed channel is derived from the optical high-speed channel;

a demodulator coupled to the frequency division demultiplexer for demodulating each low-speed symbol channel to generate a corresponding low-speed data channel~~, wherein the demodulator comprises a Reed-Solomon decoder for reversing a Reed-Solomon encoding and a de-interleaver for reversing an interleaving process~~;

a clock and data recovery circuitry coupled to the demodulator for recovering data from each low-speed data channel and for generating a reference clock synchronized to the recovered data; and

a time division multiplexer coupled to the clock and data recovery circuitry for generating a tributary, wherein the tributary contains all of the recovered data, and the tributary is timed by a clock based on the reference clock and complies with the jitter tolerance.

31. (Original) The communications system of claim 30 wherein the tributary and the jitter tolerance conform to a SONET protocol.

32. (Original) The communications system of claim 31 wherein each low-speed data channel includes:

a framing header and a data rate which conforms to the SONET protocol; and

a payload which does not conform to the SONET protocol.

33. (Original) The communications system of claim 32 wherein each low-speed data channel includes:

a framing header and a data rate which conforms to the STS-3 protocol; and

a payload which does not conform to the STS-3 protocol.

34. (Original) The communications system of claim 32 wherein each low-speed data channel includes:

a framing header and a data rate which conforms to the STS-48 protocol; and

a payload which does not conform to the STS-48 protocol.

35. (Original) The communications system of claim 30 wherein the time division multiplexer comprises a multi-stage time division multiplexer.

36. (Original) The communications system of claim 30 wherein the time division multiplexer comprises:

a state machine for aligning a timing for the receive-side low-speed data channels;

buffers for storing the recovered data from each receive-side low-speed data channel and releasing the stored recovered data according to the aligned timing; and

multiplexers for combining the released data.